

Amendments to the Specification:

Please replace paragraph [0001] with the following amended paragraph:

[0001] This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application No. 60/256,440 filed December 18, 2000. This application is also a continuation-in-part of co-pending U.S. Patent Application No. 09/742,999 filed December 20, 2000 (U.S. Patent No. 6,579,510), which is a continuation-in-part of co-pending U.S. Patent Application No. 09/625,710 filed July 25, 2000 (U.S. Patent No. _____), that claims the benefit under U.S.C. § 119(e) of U.S. Provisional Patent Application No. 60/146,635 filed July 30, 1999.

Please replace paragraph [0048] with the following amended paragraph:

[0048] The apparent synergy between Pt and Rh in the catalyst that enhances catalyst stability under SCPOX reaction conditions was also observed under CPOX reaction conditions. The Pt-Rh/Ln catalyst also has superior activity for converting an H₂S stream containing a light hydrocarbon, such as methane, to elemental sulfur and synthesis gas, by way of concurrent CPOX and SCPOX reactions carried out over the same catalyst in a single reaction zone, operating the reactor at hydrocarbon, H₂S and O₂ concentrations and process conditions that favor the formation of both sulfur, CO and H₂, as described in co-owned U.S. Patent Application No. 09/742,999 (U.S. Patent No. 6,579,510) and U.S. Patent Application No. 09/625,710 (U.S. Patent No. _____), each of which is hereby incorporated herein by reference.

Please replace paragraph [0050] with the following amended paragraph:

[0050] The carbiding process includes exposing the catalyst, in any of the forms described above, to light hydrocarbon (preferably methane, ethane or propane) under CPOX reaction conditions as described in U.S. Patent Application No. 09/625,710 (U.S. Patent No. _____). Preferably this hydrocarbon pre-treatment procedure (referred to herein as "carbiding") is carried out with the catalyst in place in the short contact time reactor. The carbiding treatment includes heating the catalyst to at least 700°C or up to about 1,500°C, preferably in the range of 850°C - 1,300°C, in the presence of

the light hydrocarbon. Upon getting the catalyst up to CPOX operating temperature, the flow of hydrocarbon is stopped and the flow of H₂S containing gas is begun for sulfur removal and recovery under SCPOX operating conditions. It is preferable to perform the carbiding treatment before exposing the catalyst to H₂S or other sulfur compound while the catalyst is at a temperature at which it can chemically react with sulfur or at which sulfur can condense on its active sites. In the carbiding treatment, it is preferable to mix the hydrocarbon with a small amount of oxygen or O₂-containing gas to deter or minimize coking of the catalyst during treatment. The amount of oxygen preferably does not exceed the stoichiometric amount necessary to support catalytic partial oxidation of the hydrocarbon (CPOX reaction), i.e., a carbon:oxygen molar ratio of 2:1. If the catalytic components are also active for catalyzing the CPOX reaction, production of synthesis gas (CO and H₂) may commence during the pre-treatment step upon reaching a temperature sufficient to initiate the reaction. Without wishing to be bound by any particular theory, it is believed that, in the case of a Pt-Rh alloy catalyst, the formation of Rh and/or Pt carbide in which at least a substantial portion of the catalytic metal component exists in the same phase with carbon (e.g., RhC_x or PtC_x), which resists the formation of metal sulfide(s) that can deactivate the catalyst by covering the active centers. Thus, the stability and life of the catalyst on H₂S stream is increased or enhanced by the carbiding treatment.

Please replace paragraph [0065] with the following amended paragraph:

[0065] An advantage of employing the above-described short contact time partial oxidation process instead of a conventional partial oxidation method is that greater concentrations of H₂S in the reactant stream can be processed by the new method than has generally been possible with known processes. The catalytic partial oxidation of hydrogen sulfide has been shown by the present inventor in co-assigned applications 09/625,710 (U.S. Patent No. _____) and 09/624,715 (U.S. Patent No. 6,403,051) to be useful for improving synthesis gas production and for concurrently producing hydrogen gas. The disclosures of those applications are incorporated herein by reference.

Please replace paragraph [0073] with the following amended paragraph:

[0073] In an alternative situation, where the H₂S content of a gas stream is relatively high, the H₂ or light hydrocarbon content is relatively low, and it is not considered desirable or feasible to recover the

non-H₂S components, it may be preferred to instead employ the system and process described in the inventor's concurrently filed U.S. Patent Application No. _____ (~~Attorney Docket No. 1856-09501~~) 10/024,167 filed December 18, 2001, entitled "Short Contact Time Catalytic Sulfur Recovery System for Removing H₂S from a Waste Gas Stream." The disclosure of that application is hereby incorporated herein by reference.

Please replace paragraph [0074] with the following amended paragraph:

[0074] In another alternative situation, in which the desulfurized natural gas product is intended for use in the production of synthesis gas, it may be preferable to instead convert the H₂S-containing natural gas stream directly to elemental sulfur and synthesis gas, by way of concurrent CPOX and SCPOX reactions carried out in a single reaction zone over a catalyst that is active for promoting both types of partial oxidation reactions. In that case, the reactor is operated at hydrocarbon, H₂S and O₂ concentrations and process conditions that favor the formation of both sulfur, CO and H₂, as described in co-owned U.S. Patent Application Nos. 09/742,999 (U.S. Patent No. 6,579,510) and 09/625,710 (U.S. Patent No. _____), each of which is hereby incorporated herein by reference.